

PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

28 SEP. 1967

Improvements in or relating to Protective Coatings

5 We, TAK CHEMICALS LIMITED, [formerly Anti-Dust Services Limited], a British Company of Hayes Lane, Lye, Stourbridge, in the County of Worcester, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to the coating of surfaces for preventing the adhesion of enamel and paint to the surfaces and is particularly applicable to the coating of jigs, cradles or pallets (hereinafter referred to generically as jigs) as are used for supporting articles to be coated by industrial enamelling or like coating operations (hereinafter referred to as enamelling.)

20 When a coating of enamel is applied to an article supported by a jig as, for example, by dipping or spraying, the jig becomes coated with enamel. The jig and the articles supported thereby are passed by means of a conveyor through an oven heated to between 25 120 and 200°C and the applied enamel becomes dried and hardened. The articles are then removed and the jig used again for further coating operations. The jig eventually becomes thickly coated because of repeated applications of enamel and the coating of enamel becomes extremely hard because of the repeated stoving and the jig must, therefore, be cleaned. There are various methods of cleaning a jig and such methods 30 include chipping by means of a hammer and chisel and immersion of the jig in a tank containing hot caustic soda or a solution of cresylic acid.

It is an object of the present invention to

[Price 4s. 6d.]

40 to provide a composition which can be applied to an article such as a jig, which composition dries on exposure to the atmosphere to form an adherent film resistant to penetration by non-aqueous enamels or the like and which on heating to elevated temperatures, for example, within the range of from 120 to 200°C, forms an expanded foam structure which is only weakly adherent to the article.

45 According to the present invention we provide a composition which can be applied to the surface of an article such as a jig and which dries to form a water-soluble film, the composition including a film-forming substance, a carbonate or bicarbonate of an alkali metal or an alkaline earth metal or ammonium carbonate or a carbonate of an organic base and an organic halogen-containing polymer which decomposes at elevated temperatures with the formation of the corresponding hydrogen halide which reacts with the carbonate or bicarbonate with the evolution of carbon dioxide and the conversion of the film to a solid foam.

60 The film-forming substance may be gelatine, starch, casein, an alkali metal caseinate, or ammonium caseinate, dextrin, gum arabic, gum tragacanth, a cellulose ether, polyvinyl alcohol, an alkali metal alginate or ammonium alginate.

70 The composition may also include a plasticiser for the film-forming substance and the plasticiser may be a mono, di-, or polyhydric alcohol, or an ester thereof. For example, the plasticiser may be ethylene glycol, glycerol, glyceryl diacetate or glyceryl triacetate.

The organic halogen-containing polymer

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may be polyvinyl chloride or a chlorinated rubber.

- 5 A catalyst may also be included in the composition to accelerate the rate of decomposition of the halogen-containing polymer. The catalyst may be a salt of zinc, copper or iron.

The invention will now be described by way of example.

- 10 An aqueous emulsion containing the following materials was employed for coating a jig:—

- 15 Gum Arabic—35 parts by weight;
Glycerol—7.5 parts by weight;
Sodium Carbonate—10 parts by weight;
Polyvinyl Chloride—2 parts by weight;
Zinc Sulphate—0.1 parts by weight;
Water—45.4 parts by weight.

- 20 The emulsion was applied to a mild steel jig by dipping the jig into the emulsion. The jig was then allowed to dry in the atmosphere for two to three hours and a coating of amine alkyd stoving enamel was applied by spraying to the jig. The enamel coating
25 was allowed to dry in the atmosphere for fifteen minutes and then heated in an oven at 120°C for thirty minutes. The jig was then removed from the oven and allowed to dry. Several further coatings of enamel were
30 then applied to the jig. On examination of the jig after these repeated coatings the coats of enamel were found to adhere only poorly to the jig and could easily be removed by chipping. Upon chipping the enamel an
35 underlying sponge-like layer was found. This sponge-like layer had not been penetrated by the various coatings of stoving enamel. Having cleared a small area of the jig by chipping, the jig was immersed in water
40 and left overnight. Upon removal from the water the coatings of enamel and the sponge-like layer were found to have been removed from the jig.

- 45 Upon heating the film obtained by coating the jig with the composition given in the example above to a temperature between 120 and 200°C a small proportion of the polyvinyl chloride decomposes with the evolution of hydrogen chloride. The hydrogen
50 chloride reacts with the sodium carbonate with the evolution of carbon dioxide which aerates the film and produced a sponge-like structure.

- 55 Alternative compositions which can be applied to a jig to form a protective coating are as follows:—

EXAMPLE A.

- 60 Water soluble maize-dextrin 32.5 parts by weight,
Water 47.0 parts by weight,
Glycerol 5.0 parts by weight,
Zinc carbonate 12.5 parts by weight,
Chlorinated rubber 2.0 parts by weight,

Sodium salt of lauryl sulphonate (a wetting agent) 1.0 parts by weight.

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EXAMPLE B.

Polyvinyl alcohol 20 parts by weight,
Glycerol 10 parts by weight,
Chlorinated rubber 2 parts by weight,
Copper sulphate 1 part by weight,
Water 57 parts by weight.

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The Compositions described above are prepared by ball milling the various ingredients together to obtain an emulsion of substantially uniform consistency.

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An advantage of the present invention is that it enables jigs which have been coated with several layers of enamel to be cleaned rapidly and inexpensively as the sponge-like layer formed upon heating the jig is water
80 soluble and tends to rupture the layers of enamel.

WHAT WE CLAIM IS:—

1. A composition which can be applied to the surface of an article such as a jig and which dries to form a water-soluble film, the composition including a film-forming substance, a carbonate or bicarbonate of an alkali metal or an alkaline earth metal or ammonium carbonate or a carbonate of an organic base and an organic halogen-containing polymer which decomposes at elevated temperatures with the formation of the corresponding hydrogen halide which reacts with the carbonate or bicarbonate with the evolution of carbon dioxide and the conversion of the film to a solid foam. 85
2. A composition as claimed in Claim 1, in which the water-soluble film-forming substance is gelatine, starch, casein, an alkali metal caseinate, ammonium caseinate, dextrin, gum arabic, gum tragacanth, a cellulose ether, polyvinyl alcohol, an alkali metal alginate or ammonium alginate. 90
3. A composition as claimed in Claim 1 or 2 which includes a plasticiser for the film-forming substance. 95
4. A composition as claimed in Claim 3, in which the plasticiser is a mono-, di- or poly-hydric alcohol or an ester thereof. 100
5. A composition as claimed in any preceding claim, in which the organic halogen-containing polymer is polyvinyl chloride or a chlorinated rubber. 105
6. A composition as claimed in any preceding claim, which includes a catalyst to accelerate the decomposition of the halogen-containing polymer, the catalyst being a salt of zinc, copper or iron. 110
7. A composition for application to the surface of an article as claimed in Claim 1, and substantially as hereinbefore described with reference to the examples given in the specification. 115
8. A method of treating articles such as jigs for facilitating the removal of layers of 120

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enamel therefrom which includes the application of a composition to the surfaces of the articles, the composition being as claimed in any preceding claim.

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